

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION**

**INFERNAL TECHNOLOGY, LLC, and
TERMINAL REALITY, INC.,**

Plaintiffs,

v.

ACTIVISION BLIZZARD INC.,

Defendant.

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Civil Action No. 3:18-cv-_____

Jury Trial Demanded

PLAINTIFFS' COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Infernal Technology, LLC and Terminal Reality, Inc. file this Complaint against Activision Blizzard, Inc. and allege as follows.

PARTIES

1. Plaintiff Infernal Technology, LLC ("Infernal Technology") is a Texas Limited Liability Company located at 18484 Preston Road, Suite 102-189, Dallas, Texas 75252.

2. Plaintiff Terminal Reality, Inc. ("Terminal Reality") is a Texas Corporation with its address at P.O. Box 271721, Flower Mound, Texas, 75027-1721. Terminal Reality, a video game development and production company, was formed in 1994 in Lewisville, Texas. Terminal Reality developed a number of video games, such as *Nocturne*, *Bloodrayne*, *Ghostbusters: The Video Game*, *Kinect Star Wars*, *The Walking Dead: Survival Instinct*, and many others. Terminal Reality also developed a video game graphics engine, called the "Infernal Engine," used in many of Terminal Reality's games. In addition to using the "Infernal Engine" in its own games, Terminal Reality successfully licensed the "Infernal Engine" to other

video game developers for use in their video games. On June 3, 2014, Terminal Reality granted Infernal Technology an exclusive license to a number of patents, including the Asserted Patents as defined below, and the exclusive right to enforce those patents. Infernal Technology and Terminal Reality are collectively referred to herein as “Plaintiffs.”

3. Defendant Activision Blizzard Inc. (“Activision Blizzard”) is a corporation organized and existing under the laws of the State of Delaware, with its principal place of business located at 3100 Ocean Park Boulevard, Santa Monica, California 90405. Activision Blizzard may be served with process through its registered agent Corporation Service Company, 251 Little Falls Drive, Wilmington, Delaware 19808.

JURISDICTION AND VENUE

4. This is an action for patent infringement arising under the patent laws of the United States of America, Title 35, United States Code. This Court has original jurisdiction over the subject matter of this action pursuant to 28 U.S.C. §§ 1331 and 1338(a).

5. Activision Blizzard is engaged in the business of developing, testing, publishing, distributing, and selling video games. Many of these video games employ game “engines” which are tools available for video game designers to code and plan out a game. Activision Blizzard utilizes various game engines to develop and run its portfolio of video games which infringe one or more claims of the patents asserted in this complaint (“Accused Game Engines”). These Accused Game Engines include, but are not limited to, the Horizon Engine, Black Ops III Engine, Infinity Ward 7.0 Engine, Destiny Engine, Destiny 2 Engine, Unreal Engine 4, Overwatch Engine, Starcraft 2 Engine, Titanium Engine, Titanium 2.0 Engine, and Skylanders Engine. The Accused Game Engines are game engines that are capable of performing deferred rendering, deferred shading, deferred lighting, physically based shading, and/or physically based

rendering used in video games developed, published, distributed, and/or sold by Activision Blizzard.

6. The video games developed, published, distributed, and sold by Activision Blizzard that use the Accused Game Engines include, but are not limited to, Blur, Call of Duty: Black Ops III, Call of Duty: Infinite Warfare, Crash Bandicoot N. Sane Trilogy, Destiny, Destiny: The Taken King, Destiny: Rise of Iron, Destiny 2, Ghostbusters (2016), Heroes of the Storm, Overwatch, Prototype: Biohazard Bundle, Prototype 2, Skylanders: Giants, Skylanders: SWAP Force, Skylanders: Spyro's Adventure, Skylanders: Trap Team, Starcraft 2, and World of Warcraft: Warlords of Draenor. Blur and all other games developed, published, distributed, and/or sold by Activision Blizzard that use the Accused Game Engines and referred to herein as the "Accused Games." Activision Blizzard has developed, published, distributed, used, offered for sale and sold the Accused Games in the United States, including within this District.

7. The Accused Game Engines and Accused Games are collectively referred to herein as the "Accused Instrumentalities."

8. Activision Blizzard is subject to this Court's specific personal jurisdiction because it (a) is a resident of the State of Texas; and (b) has designated an agent for service of process in the State of Texas; and (c) has committed acts of infringement in the State of Texas as alleged herein.

9. In particular, according to Activation Blizzard's Annual Reports, since 2008 Activation Blizzard has had a sales office in Dallas, Texas, and a customer service center in Austin, Texas. Activation Blizzard has infringed the patents asserted in this case in the State of Texas by using, offering to sell and selling Accused Games through these offices in Texas. Activation Blizzard has also infringed the patents asserted in this case in the State of Texas by

using other distribution channels, including digital downloads and retail stores, to sell the Accused Games to residents of the State of Texas. Activision Blizzard has also infringed the patents asserted in this case in the State of Texas by inducing residents of the State of Texas to use the methods claimed in those patents without authorization from Plaintiffs. Therefore, this Court has personal jurisdiction over the Activision Blizzard under the Texas long-arm statute, TEX. CIV. PRAC. & REM. CODE § 17.042.

10. Venue is proper in this district under 28 U.S.C. §§ 1400(b). Activision Blizzard has a regular and established business under § 1400(b) because it has a sales office located at located at 13760 Noel Road, Dallas, Texas 75240. Activision Blizzard has committed acts of infringement in this District by selling, offering to sell and using the Accused Games in this District.

THE PATENTS-IN-SUIT

11. On March 26, 2002 the United States Patent and Trademark Office issued United States Patent No. 6,362,822 (the “’822 Patent”) entitled “Lighting and Shadowing Methods and Arrangements for use in Computer Graphic Simulations,” a true copy of which is attached as Exhibit 1.

12. On June 13, 2006, the United States Patent and Trademark Office issued United States Patent No. 7,061,488 (the “’488 Patent”) entitled “Lighting and Shadowing Methods and Arrangements for use in Computer Graphic Simulations,” a true copy of which is attached as Exhibit 2. The ’488 Patent is a continuation-in-part of the ’822 Patent. The ’822 and ’488 Patents are collectively referred to as the “Asserted Patents.” The inventor of the inventions described and claimed in the Asserted Patents is Mark Randel.

13. Infernal Technology is the exclusive licensee of the '822 and '488 Patents and has the exclusive right to sue for and recover all past, present and future damages for infringement of the Asserted Patents.

14. The Asserted Patents are directed to methods and arrangements for use in rendering lighting and shadows in computer graphic simulation. As the specification of the '822 Patent states, “[t]he present invention relates to computer graphics and, more particularly, to improved methods and arrangements for use in rendering lighting and shadows in computer graphic simulations, such as, for example, interactive computer graphics simulations of multi-dimensional objects.” *See* Exhibit 1 at 1:6-11. At the time of the invention of the '822 patent, computer generated graphics were becoming popular due to increased processing capabilities of personal computers. *Id.* at 1:14-24. In particular, virtual three-dimensional (3D) worlds were being created for computer games that could be interactively explored by a user. These virtual 3D worlds consist of a plurality of 3D objects, which are typically modeled by one or more polygons. *Id.* at 1:25-38. These objects are displayed to a user by projecting the objects onto a 2D frame as viewed from a particular viewpoint. *Id.*

15. The goal of 3D graphics rendering is to provide “a realistic, interactive virtual 3D world to the user.” *Id.* at 1:53-56. Because there is a limit to the amount of processing that a computer can provide, there has always been a need for faster, more efficient and higher quality means for producing the 3D to 2D renderings. *Id.* at 1:53-56. As the '822 patent explains, “simplifications or other compromises often need to be made in modeling a 3D world,” and “[o]ne of the unfortunate compromises made in the past, has been in the area of lighting and, more particularly, in the area of rendering shadows cast by lighted 3D objects.” *Id.* at 1:49-50, 57-59. This is because “[m]any shadow rendering processes have been considered too compute

intensive for most lower-end computer applications.” *Id.* at 1:59-63. The Asserted Patents, therefore, sought to provide improved shadow rendering methods and arrangements that would “support real time interactive graphics on conventional PCs and the like, and allow for multiple light sources to be modeled in a more efficient and realistic manner.” *Id.* at 2:66-3:3. This improved rendering is accomplished by operating on rendered pixels in 2D space and using a separate buffer to accumulate light falling on each pixel from multiple light sources.

16. Thus, the invention of the Asserted Patents provides improved methods and arrangements for use in producing lighting and shadows that operate in the 2D domain, after the three-dimensional scene has been rendered. The claimed methods and arrangements were not well-understood, routine, and conventional activities commonly used in industry. The graphics industry immediately recognized the groundbreaking innovations described in the ’822 Patent, commenting on the lighting and shadows rendered by Mr. Randel’s *Nocturne* game using the patented invention: “[a]ll the hype surrounding the lighting in the game was for a really good reason -- *Nocturne* pushes videogame lighting to new heights, with shadows that are so inventive and interactive that you’ll swear you’re actually watching a film at times.”¹

THE ESTABLISHED VALIDITY OF THE PATENTS-IN-SUIT

17. On April 21, 2016, Electronic Arts Inc. (“EA”) petitioned the U.S. Patent Trial and Appeal Board (“PTAB”) for *inter partes* review of the ’822 and ’488 Patents (IPR2016-00928, IPR2016-00929, IPR2016-00930Z). In the IPR petitions, EA relied upon the following prior art references: (1) Segal, *et al.*, “Fast Shadows and Lighting Effects Using Texture Mapping,” *Computer Graphics Proceedings*, Volume 26, Number 2, July, 1992 (“Segal”); and (2) McReynolds, “Programming with OpenGL: Advanced Rendering,” SIGGRAPH ’96 Course,

¹ <http://www.ign.com/articles/1999/11/23/nocturne>.

August, 1996 (“McReynolds”). With respect to the ’822 Patent, EA asserted that Claims 1-10 and 39-48 were unpatentable under 35 U.S.C. § 103 in view of Segal, and that Claims 1-20 and 39-48 were unpatentable under 35 U.S.C. § 103 as obvious over the combination of Segal and McReynolds. With respect to the ’488 Patent, EA argued that Claims 1-10, and 27-62 were unpatentable under Section 103 in view of Segal and that Claims 1-20 and 27-36 were unpatentable under Section 103 in view of Segal in combination with McReynolds.

18. On October 25, 2016, the PTAB instituted IPR proceedings as to all challenged claims of the ’822 and ’488 Patents. In addition to the Segal and McReynolds references asserted by EA in its petitions, the PTAB instituted IPR based on an additional prior art reference: James D. Foley, *et al.*, COMPUTER GRAPHICS, PRINCIPLES AND PRACTICE, 2^d ed. (1997) (“Foley”). Oral argument was heard by the PTAB on July 18, 2017. On October 19, 2017, and on October 23, 2017, the PTAB issued its Final Written Decisions in the IPR proceedings rejecting all of EA’s challenges to the patentability of all claims of the ’822 and ’488 Patents in view of Segal, alone or in combination with McReynolds and/or Foley. Shortly thereafter, EA settled Plaintiffs’ patent infringement claims and entered into a formal settlement agreement with Plaintiffs.

ACTIVISION BLIZZARD BACKGROUND

19. Activision Blizzard describes itself as “a leading global developer and publisher of interactive entertainment content and services.”² According to Activision Blizzard, “[w]e develop and distribute content and services on video game consoles, personal computers [], and mobile devices.” *Id.* Activision Blizzard also describes itself as “the world’s most successful standalone interactive entertainment company,” and states that “[i]t develops and publishes

² Activision Blizzard, Inc. 2017 Form 10K at 2.

games based on some of the most beloved entertainment franchises. . . .”³ “Activision Blizzard has operations throughout the world, and its games are played in 196 countries.”⁴

20. Activision Blizzard is the product of a merger in 2008 between Activision, Inc. and Vivendi S.A., which owned a company called Blizzard Entertainment. As a result of this merger, the combined entity was renamed Activision Blizzard, Inc., and “Activision Blizzard [became] a leader in both console and subscription-based online games.”⁵ The stated purpose of the merger was “to create Activision Blizzard, as the world's most profitable pure-play online and console game publisher.”⁶

21. After Activision Blizzard was created, it implemented a restructuring of the organization and management of the combined enterprise. “This organizational restructuring plan included the integration of different operations to streamline the combined organization of Activision Blizzard. The primary goals of the organizational restructuring are to rationalize the title portfolio and consolidate certain corporate functions to realize synergies from the Business Combination.”⁷

22. Activision Blizzard established three operating segments as part of this restructuring. One is called Activision Publishing, Inc. (“Activision Publishing”), which publishes interactive entertainment software and peripherals, and which includes businesses

³ <https://www.businesswire.com/news/home/20160223006057/en/Activision-Blizzard-Completes-King-Acquisition-Largest-Game>.

⁴ <https://investor.activision.com/news-releases/news-release-details/activision-blizzard-announces-first-quarter-2018-financial>

⁵ Activision Blizzard 2008 Annual Report at 10.

⁶ <https://investor.activision.com/static-files/31ce47c9-c252-4105-ba87-5362c4c64955>.

⁷ Activision Blizzard 2009 Annual Report at 53.

operated by Activision Publishing, Inc. prior to the merger and studios, assets, and titles previously included in Vivendi's operations prior to the merger. Another operating segment is called Blizzard Entertainment, Inc. ("Blizzard Entertainment"), which publishes real-time strategy, role-playing PC games and online subscription-based games in the massively multiplayer online roleplaying game category ("MMORPG"). The third operating segment was called Activision Blizzard Distribution which consisted of operations in Europe providing warehousing, logistical, and sales distribution services to third-party publishers of interactive entertainment software, its own publishing operations, and manufacturers of interactive entertainment hardware.⁸ Activision Blizzard Distribution is no longer considered an operating segment. Activision Blizzard has directed and controlled its video game business through the Activision Publishing and Blizzard Entertainment operating segments.

23. As part of the restructuring of the organization and management of the combined Activision and Vivendi enterprise, Activision Blizzard named Thomas Tipl as Chief Corporate Officer in addition to his position as Chief Financial Officer. Mr. Tipl succeeded Bruce Hack, who has stepped down from the position following the business combination.⁹ Mr. Tipl, as Chief Corporate Officer, would oversee the operations of the Activision Publishing and Blizzard Entertainment operating segments as well as the company's Strategic Planning, Global Sales and Supply Chain, IT, Legal and Human Resources departments.¹⁰ Tipl occupied the position of Chief Corporate Officer (aka Chief Operating Officer) until May 2017, when he was replaced by

⁸ Activision Blizzard 2010 Annual Report at 58.

⁹ <https://investor.activision.com/news-releases/news-release-details/activision-blizzard-reports-record-december-quarter-and-calendar>.

¹⁰ <https://investor.activision.com/news-releases/news-release-details/dennis-durkin-named-chief-financial-officer-activision-blizzard>.

CFO Denis Durkin. Pursuant to a management policy implemented with the creation of Activision Blizzard, the operations of the Activision Publishing and Blizzard Entertainment operating segments are also reviewed and managed by the Chief Executive Officer of Activision Blizzard. Since its inception, Activision Blizzard's CEO has been Robert Kotick who also has been designated as the Chief Operating Decision Maker for all of the operations of Activision Blizzard.¹¹ The Presidents/CEOs of the Activision Publishing and Blizzard Entertainment also served as officers of Activision Blizzard. *Id.* Thus, as a result of the restructuring of the combined Activision/Vivendi enterprise, the Activision Blizzard CEO and COO have managed and overseen the operations of Activision Publishing and Blizzard Entertainment and the Presidents/CEOs of the Activision Publishing and Blizzard Entertainment, who are also officers of Activision Blizzard, implement Activision Blizzard's management and control of those operating segments.

24. Within a year of the Activision/Vivendi merger, CEO Robert Kotick reported that Activision Blizzard “successfully achieved our merger restructuring goals, including the elimination of unprofitable product lines, right sizing our organization and integrating disparate accounting and IT systems, all with minimal disruption to our business.”¹² Activision Blizzard emphasized that “we are constantly working to improve the core operations of our two divisions—Activision and Blizzard Entertainment. Activision Blizzard proudly announced that “Activision Blizzard had two of the top-five best-selling franchises on the consoles across all platforms . . . and was the #1 third-party publisher for the Wii platform.” *Id.* Later that year

¹¹ See Activision Blizzard Annual Reports for 2009-2017.

¹² <https://investor.activision.com/news-releases/news-release-details/activision-blizzard-reports-record-december-quarter-and-calendar>.

Activision Blizzard emphasized that “Activision Blizzard had two of the top five best-selling titles across all platforms in the U.S. and Europe,” and “had three of the top-10 best-selling PC titles in dollars in the U.S.”¹³

25. In 2011, Activision Blizzard implemented another restructuring of its video game business “involving a focus on the development and publication of a reduced slate of titles on a going-forward basis, including the discontinuation of the development of music-based games, the closure of the related business unit and the cancellation of other titles then in production, along with a related reduction in studio headcount and corporate overhead.”¹⁴

26. In 2013, Activision Blizzard implemented an \$8.2 billion investor buyout of Vivendi’s majority stock ownership of the company.¹⁵ With Vivendi no longer a major stockholder, Activision Blizzard became an independent company.¹⁶ As a result, Activision Blizzard announced that it now was “the largest and most-profitable independent videogame publisher in North America and Europe.” *Id.*

27. In 2015, Activision Blizzard acquired King Digital Entertainment plc. -- a mobile game developer whose games are available principally on tablets and smartphones using the major operating systems available on the market. The CEO of Activision Blizzard observed that,

¹³ <https://investor.activision.com/news-releases/news-release-details/activision-blizzard-announces-better-expected-first-quarter-cy>.

¹⁴ See Activision Blizzard 2011 Annual Report at 46.

¹⁵ <https://investor.activision.com/static-files/e7591110-6c71-41d1-9360-bcd9fe5ca>.

¹⁶ See Activision Blizzard 2013 Annual Report.

as a result of this acquisition, “[w]e now reach over 500 million users across almost every country, making us the largest game network in the world.”¹⁷

28. Activision Blizzard has continued to develop and publish new video games and new content for existing games. In 2017, Activision Blizzard announced that “[t]he company achieved a new milestone with players spending over 50 minutes per day in Activision Blizzard games, in line with some of the most engaging online connected platforms in the world.”¹⁸

29. Most of the content for Activision Blizzard’s video game franchises is developed by internal studios owned and controlled by Activision Blizzard (“Activision Studios”). Periodically, Activision Blizzard engages independent third-party developers to create content on its behalf (“Third-Party Developers”). For example, since 2010, Activision has been in a long-term exclusive relationship with Bungie, the developer of game franchises including Halo, Myth, and Marathon, to publish games in the Destiny franchise. Pursuant to this contractual relationship, Activision Blizzard has exclusive, worldwide rights to publish and distribute on multiple platforms all future Bungie games based on Destiny.

30. Upon information and belief, Activision Publishing and Blizzard Entertainment provide reports to Activision Blizzard regarding its business operations and activities, including the infringing activities alleged herein, for review and approval by Activision Blizzard.

31. Since the Activision/Vivendi merger, Activision Blizzard has managed, directed and controlled the development, testing, production, marketing and sale of video games through the Activision Publishing and Blizzard Entertainment operating segments. Upon information

¹⁷ <https://investor.activision.com/news-releases/news-release-details/activision-blizzard-completes-king-acquisition-becomes-largest>.

¹⁸ <https://investor.activision.com/static-files/f2a2bb2e-72a2-430c-ac6c-2cf679218194>.

and belief, Activision Blizzard senior management decide whether and how to grow existing video game franchises and whether to develop new video game franchises. Activision Blizzard senior management decide whether to release new content for video game franchises or to discontinue video game franchises. Activision Blizzard controls the timing of development cycles for video game franchises. Activision Blizzard controls which Activision Blizzard studios or independent studios will be involved in developing new video games or new content for existing games. Activision Blizzard controls the quality control and assurance measures implemented with respect to the development of video games. Activision Blizzard also controls the “greenlighting” of video games for publication and determines how to market and distribute video game products. Activision Blizzard has consistently treated Activision Publishing and Blizzard Entertainment as divisions of Activision Blizzard and were described by Activision Blizzard as such.¹⁹

32. As the CFO for Activision Publishing stated, “Activision Blizzard’s Santa Monica headquarters is the strategic center of its business. Decisions related to Activision Blizzard’s overall business, including the most significant decisions related to Activision Publishing’s video games, are made by managers and other employees located in Santa Monica.”²⁰

¹⁹ <https://investor.activision.com/news-releases/news-release-details/call-duty-world-league-stage-1-playoffs-presented-playstation4>; <https://investor.activision.com/news-releases/news-release-details/call-duty-world-league-takes-over-new-orleans-0>; <http://investor.activision.com/node/31511/pdf>; <https://investor.activision.com/static-files/d2575755-df5c-4864-9e6d-a5428a869e22>; <https://investor.activisionblizzard.com/static-files/bbaac6af-7cf6-4028-8726-326aa7c85ae3>.

²⁰ *Acceleration Bay LLC v Activision Blizzard, Inc.*, No. 1:16-cv-00453-RGA, Dkt. No. 7-1 at 2.

33. Activision Blizzard has exercised substantial decision-making authority over Activision Publishing and Blizzard Entertainment with respect to the development, testing, production, marketing and sale of the Accused Games.

34. Activision Blizzard, through its senior management, has directed and controlled the actions of Activision Publishing, Blizzard Entertainment and the Activision Studios involved in the development, testing, production, marketing and sale of the Accused Instrumentalities.

35. Upon information and belief, with respect to Third-Party Developers involved in the development of any of the Accused Instrumentalities, Activision Blizzard, through its divisions Activision Publishing and Blizzard Entertainment, has entered into contracts with those Third-Party Developers (the “Third-Party Developer Contracts”) requiring them to use the Accused Game Engines in the development and testing of the Accused Games.

36. Activision Publishing, Blizzard Entertainment, the Activision Studios and the Third-Party Developers involved in the development, testing, production, marketing and sale of the Accused Instrumentalities have acted as the agents of Activision Blizzard in connection with the infringing activity described herein.

37. At all times during which the infringing activity described herein occurred, Activision Blizzard had the right and ability to stop the infringing activity. With respect to Activision Publishing, Blizzard Entertainment and Activision Studios, Activision Blizzard has owned and controlled those entities through the senior management of Activision Blizzard. As alleged above, the Activision Blizzard senior management have cancelled video games while they are being developed and discontinued video games after they have been published. With respect to the Third-Party Developers, Activision Blizzard controlled and directed the infringing activities of these entities through the Third-Party Developer Contracts.

38. Activision Blizzard provided directions to Activision Publishing, Blizzard Entertainment, the Activision Studios and the Third-Party Developers regarding which video games to develop, how to develop and test the games, whether to continue development of the games, whether to publish the games, and how to market and sell the games, including the Accused Games.

39. Activation Blizzard, through the Activision Publishing, Blizzard Entertainment, and Activision Studios or Developers, has orchestrated the process of the development, testing, production, marketing and sale of the Accused Games.

40. Activision Publishing, Blizzard Entertainment, and the Activision Studios or Developers, by following and implementing the directions provided to them by Activation Blizzard, have committed the acts of infringement alleged herein.

41. The Third-Party Developers, by performing their contractual obligations pursuant to the Third-Party Studio Developer Contracts, have committed the acts of infringement alleged herein.

CLAIM 1 -- INFRINGEMENT OF U.S. PATENT NO. 6,362,822

42. Plaintiffs incorporate paragraphs 1 through 38 as though fully set forth herein.

43. Upon information and belief, Activision Blizzard has been and is now directly infringing one or more of the method claims of the '822 Patent in the United States, by using those methods through, among things, testing, displaying and demonstrating the Accused Games and Accused Game Engines in violation of 35 U.S.C. § 271(a). The Accused Games and Accused Game Engines perform the lighting and shadowing methods described and claimed in one or more of the method claims of the '822 Patent.

44. For example, but not as a limitation, Activision Blizzard's direct infringement of Claim 1 of the '822 Patent with respect to Accused Games using the Unreal Engine and Tiger Engine is shown in the claim charts of Exhibits 3 and 5.

45. As set forth in Exhibits 3 and 5, each of the Accused Games and Accused Game Engines performs a shadow rendering method for use in a computer system.

46. As set forth in Exhibits 3 and 5, each of the Accused Games and Accused Game Engines provides observer data of a simulated multi-dimensional scene.

47. As set forth in Exhibits 3 and 5, each of the Accused Games and Accused Game Engines provides lighting data associated with a plurality of simulated light sources arranged to illuminate the simulated multi-dimensional scene, said lighting data including light image data.

48. As set forth in Exhibits 3 and 5, for each of the plurality of light sources, each of the Accused Games and Accused Game Engines compares at least a portion of the observer data with at least a portion of the lighting data to determine if a modeled point within the scene is illuminated by the light source, and stores at least a portion of the light image data associated with the modeled point and the light source in a light accumulation buffer.

49. As set forth in Exhibits 3 and 5, each of the Accused Games and Accused Game Engines combines at least a portion of the light accumulation buffer with the observer data.

50. As set forth in Exhibits 3 and 5, each of the Accused Games and Accused Game Engines displays the resulting image data to a computer screen.

51. Because all of the Accused Games and Accused Game Engines perform deferred rendering/shading/lighting, and/or physically based shading/rendering as exemplified in Exhibits 3 and 5, any Accused Games employing any of the Accused Game Engines infringes one or

more of the method claims of the '822 Patent in a manner substantially the same as shown in the exemplary claim charts of Exhibits 3 and 5.

52. Activision Blizzard has been and is now indirectly infringing one or more of the method claims of the '822 Patent by inducing third-party end users of the Accused Games and third-party developers using the Accused Game Engines to develop video games which directly infringe one or more of the method claims of the '822 Patent in violation of 35 U.S.C. § 271(b) by playing the Accused Games using the Accused Game Engines.

53. Upon information and belief, Activision Blizzard has promoted use of the Accused Games and Accused Game Engines, which perform one or more methods claimed in one or more of the method claims of the '822 Patent, by third-party end users and third-party video game developers of the Accused Games and Accused Game Engines. Activision Blizzard has promoted such use of the Accused Games and Accused Game Engines with the knowledge that such use would result in performance of one or more methods of one or more of the method claims of the '822 Patent. Performance of the lighting and shadowing methods claimed in one or more of the method claims of the '822 Patent is an essential part of the functionality of the Accused Game Engines and Accused Games. Upon information and belief, Activision Blizzard provides third-party end users with instructions regarding how to install and play Accused Games with the knowledge that doing so will result in performing one or more of the methods claimed in the method claims of the '822 Patent. Upon information and belief, Activision Blizzard has intended, and continues to intend, to induce third-party end users and video game developers to use the Accused Games or Accused Game Engines to perform one or more of the methods claimed in the method claims of the '822 Patent.

54. Upon information and belief, Activision Blizzard has had knowledge that its conduct of designing, developing, promoting, providing and selling the Accused Instrumentalities would cause third-party end users and third-party video game developers to perform one or more methods claimed in one or more of the method claims of the '822 Patent, or has been willfully blind to the possibility that its acts would induce such direct infringement. On information and belief, Activision Blizzard is or should be aware that the Accused Games and Accused Game Engines perform one or more of the lighting and shadowing methods of one or more of the method claims of the '822 Patent and, therefore, that third-party end users and video game developers using the Accused Instrumentalities will directly infringe the '822 Patent by using the Accused Game Engines and Accused Games.

55. Plaintiffs have been damaged by Activision Blizzard's activities infringing the '822 Patent.

CLAIM 2 – INFRINGEMENT OF U.S. PATENT NO. 7,061,488

56. Plaintiffs incorporate paragraphs 1 through 52 as though fully set forth herein.

57. Upon information and belief, Activision Blizzard has been and is now directly infringing one or more of the method claims of the '488 Patent in the United States, by using those methods through, among things, testing, displaying and demonstrating the Accused Games and Accused Game Engines in violation of 35 U.S.C. § 271(a). The Accused Games and Accused Game Engines perform the lighting and shadowing methods described and claimed in one or more of the method claims of the '488 Patent.

58. For example, but not as a limitation, Activision Blizzard's direct infringement of Claim 1 of the '488 Patent with respect to the Accused Games using the Unreal Engine and Tiger Engine is shown in the claim charts of Exhibits 4 and 6.

59. As set forth in Exhibits 4 and 6, each of the Accused Instrumentalities and Accused Game Engines performs a shadow rendering method for use in a computer system.

60. As set forth in Exhibits 4 and 6, each of the Accused Instrumentalities and Accused Game Engines provides observer data of a simulated multi-dimensional scene.

61. As set forth in Exhibits 4 and 6, each of the Accused Games and Accused Game Engines provides lighting data associated with a plurality of simulated light sources arranged to illuminate the simulated multi-dimensional scene, said lighting data including light image data.

62. As set forth in Exhibits 4 and 6, for each of the plurality of light sources, each of the Accused Games and Accused Game Engines compares at least a portion of the observer data with at least a portion of the lighting data to determine if a modeled point within the scene is illuminated by the light source, and stores at least a portion of the light image data associated with the modeled point and the light source in a light accumulation buffer.

63. As set forth in Exhibits 4 and 6, each of the Accused Games and Accused Game Engines combines at least a portion of the light accumulation buffer with the observer data.

64. As set forth in Exhibits 4 and 6, each of the Accused Games and Accused Game Engines outputs the resulting image data.

65. Because all of the Accused Games and Accused Game Engines, upon information and belief, perform deferred rendering/shading/lighting, and/or physically based shading/rendering as exemplified in Exhibits 4 and 6, any Accused Games employing any of the Accused Game Engines infringes one or more of the method claims of the '488 Patent in a manner substantially the same as shown in the exemplary claim charts of Exhibits 4 and 6.

66. Because all of the Accused Game Engines, upon information and belief, are capable of performing deferred rendering/shading/lighting, and/or physically based

shading/rendering as described above with respect to the example Accused Game Engines, each of the Accused Engines infringes in a manner similar to as shown in the exemplary claim charts of Exhibits 4 and 6.

67. Activision Blizzard, with knowledge of the '488 Patent, has been and is now indirectly infringing one or more of the method claims of the '488 Patent by inducing third-party end users of the Accused Games and third-party developers using the Accused Game Engines to develop video games which directly infringe one or more of the method claims of the '488 Patent in violation of 35 U.S.C. § 271(b) by playing the Accused Games using the Accused Game Engines.

68. Upon information and belief, Activision Blizzard has promoted use of the Accused Games and Accused Game Engines, which perform one or more methods claimed in one or more of the method claims of the '488 Patent, by third-party end users and third-party video game developers of the Accused Games and Accused Game Engines. Activision Blizzard has promoted such use of the Accused Games and Accused Game Engines with the knowledge that such use would result in performance of one or more methods of one or more of the method claims of the '488 Patent. Performance of the lighting and shadowing methods claimed in one or more of the method claims of the '488 Patent is an essential part of the functionality of the Accused Game Engines and Accused Games. Upon information and belief, Activision Blizzard provides third-party end users with instructions regarding how to install and play Accused Games with the knowledge that doing so will result in performing one or more of the methods claimed in the method claims of the '488 Patent. Upon information and belief, Activision Blizzard has intended, and continues to intend, to induce third-party end users and video game

developers to use the Accused Games or Accused Game Engines to perform one or more of the methods claimed in the method claims of the '488 Patent.

69. Upon information and belief, Activision Blizzard has had knowledge that its conduct of designing, developing, promoting, providing and selling the Accused Instrumentalities would cause third-party end users and third-party video game developers to perform one or more methods claimed in one or more of the method claims of the '488 Patent, or has been willfully blind to the possibility that its acts would induce such direct infringement. On information and belief, Activision Blizzard is or should be aware that the Accused Games and Accused Game Engines perform one or more of the lighting and shadowing methods of one or more of the method claims of the '488 Patent and, therefore, that third-party end users and video game developers using the Accused Instrumentalities will directly infringe the '488 Patent by using the Accused Game Engines and Accused Games.

70. Plaintiffs have been damaged by Activision Blizzard's activities infringing the '488 Patent.

DEMAND FOR JURY TRIAL

71. Plaintiffs, under Rule 38 of the Federal Rules of Civil Procedure, request a trial by jury of any issues so triable.

PRAYER FOR RELIEF

WHEREFORE, Plaintiffs request the following relief:

1. A judgment in favor of Plaintiffs that Activision Blizzard has directly infringed, and/or has indirectly infringed by way of inducement, one or more claims of the Asserted Patents;

2. A judgment and order requiring Activision Blizzard to pay Plaintiffs damages adequate to compensate for infringement under 35 U.S.C. § 284, which damages in no event shall be less than a reasonable royalty for the use made of the inventions of the Asserted Patents, including pre- and post-judgment interest and costs, including expenses and disbursements; and

3. Any and all such further necessary relief as the Court may deem just and proper under the circumstances.

Dated: May 31, 2018

Respectfully submitted,

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